DOCUMENT RESUME

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ABSTRACT

The inservice teacher education materials described are for secondary level teachers who wish to increase their understanding of statistics and skill in presenting statistics as an understandable and relevant subject. Included in this informative report are the scope and sequence of module topics, activities and resources involved in use of the materials, ordering information, and a critique of the product. (JD)

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DESCRIPTION OF TEACHER INSERVICE EDUCATION MATERIALS

SUMMARY INFORMATION

Title: STATISTICS BY EXAMPLE (Overview)

Publication Date(s): Copyright 1973

Intended Users: Preservice and inservice teachers interested in making statistics a more relevant, easily understood classroom subject

Grade Level(s): Secondary

Number: Individual or class-sized group

Primary Focus: The intent of the series is to increase teachers' understanding of statistics and skill in presenting statistics as an understandable, relevant subject.

School subject(s) and/or inservice topic(s) covered:

The subject treated in this series is statistics. Substantive areas touched on include biology, business, physical science, the social sciences, English, mathematics and sports. Examples are drawn from everyday life -- the series focuses on "real problems" with "real data".

What participant does in using the materials: The participant reads the material, taking each book as a separate learning activity. While reading, s/he completes the exercises presented after each chapter. Upon completion of a chapter, the participant implements a suggested project in his/her classroom, and checks results against given solutions and interpretations. Comparisons may also be made with the results of the other participants' projects, on an individual or group basis.

Resources: The total program is comprised of four texts, each with an accompanying Teacher's Commentary and Solutions Manual. A copy of each text should be provided for all participants, and a copy of each commentary should be retained by the instructor. If the modules are studied by a person working alone he or she would need a copy of each commentary. A regular classroom of students will be needed for implementation of the suggested projects. Time will vary according to the number of texts studied and to the extent to which the projects implemented.

Describer critique: The series presents a practical, timely approach to the task of learning and teaching statistics. The emphasis on real-life applicability of statistics is both interesting and effective. The program's rationale and purpose are innovative, as is the manner in which the content is presented. The describer feels that these books represent a thorough, well-organized and new attitude and approach to the subject of statistics.

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1.0 PURPOSES:

Rationale

By way of explaining the rationale on which the development of this product was based, the developer makes the point that: "examples of statistical activity, problems and conclusions are abundant. They appear ... in almost every aspect of life... Nevertheless, clear, interesting, and elementary written descriptions of such examples are hard for students and teachers to find." It is the developer's intention to provide these clear, elementary statistical examples to the regular classroom teacher through the illustrative information presented in this module.

Goals

The overall aim of this product is the increased understanding of statistics. The book was created with the "idea that some knowledge of statistics is important for everybody and that some parts of statistics are easily understood by everybody. The anticipated outcome is that participants will incorporate statistics in their classroom instruction in a manner which will make the subject more easily understood and practically applicable for their students."

Objectives

As simplified statistics for teacher and student is the end goal of this product, the developer stresses that the means to this end is the use of "real-life problems" and "a more explanatory text than (is found) in the usual mathematics book". The program's principle objective is to equip participants with "real"; i. e., simple and understandable, examples with which to approach the teaching of statistics in the classroom.

2.0 CONTENT — Scope and Sequencing of Topics:

This series, which could take a year to cover if used in its entirety, has four volumes:

Exploring Data
Weighing Chances
Detecting Patterns
Finding Models

The contents of these texts are listed in their individual descriptions. A brief explanation of each text follows:

1. "Exploring Data -- 125 page text, 79 page commentary, shows how to organize data tabularly and graphically to get messages and exhibit them, and it introduces elementary probability in circumstances where simple counting gets one off to a good start."

2. "Weighing Chances -- 145 page text; 71 page commentary, develops probability methods through random numbers, simulation and simple probability models."

3. "Detecting Patterns -- 165 page text; 56 page commentary, presents several standard statistical devices -- the normal distribution, the Chi-Square test and regression methods."

4. "Finding Models -- 146-page text; 47 page commentary, encourages students to develop models as structures of data, so that departures from models can be recognized and new structures built."

Each text has an Instructor's Manual which offers commentary and solutions.

The developer does not insist that all four units be used; it is suggested by the developer that when using all four books, the participant begin with Exploring Data, as the information presented there is basic to an understanding of the later texts.

3.0 ACTIVITIES AND RESOURCES INVOLVED IN USE OF PRODUCT

3.1 Description of main *inservice* activities:

Participant: Reads texts
Does exercises
Checks exercises in teacher's commentaries
Reads discussion of each set of exercises

An instructor (e. g., head teacher) will be helpful in overseeing the group and in evaluating participants' in-class application of the material. Time required will vary according to the extent to which the suggested projects are employed in the classroom.

3.2 Help given in use of product:

A manual is supplied with each of the four texts. They contain commentary on the individual chapters, solutions to the suggested projects, and in some cases, a reference list.

The developer does not specify that the group instructor need any special qualifications; the describer feels that special qualifications are unnecessary.

4.0 EVALUATION OF TEACHER INSERVICE LEARNING

No pre/mid/post-assessments are provided with the product, though a group instructor could devise them if desired. Evaluation will take place as the participant compares the results of his/her classroom projects with the solutions provided in the manual. Participants may evaluate each other, or may be evaluated by an instructor.

5.0 ORDERING INFORMATION

5.1 Resources required/recommended for implementing product:

- One copy of each text per participant
- An instructor, for a group learning situation
- Classroom and ordinary equipment
- Peers
- Students to teach

Time required will vary with the individual and will depend on the extent to which the various units are covered. If the total series is studied and implemented, two school semesters may be required.

5.2 Distributor name/address:

Addison-Wesley Publishing Co.
Innovative Publishing Division
Sand Hill Road
Menlo Park, CA 94025

(415) 854-0300

5.3 Components/approximate costs:

Component	Purchase	Rental	No. Req.	Reusable
STATISTICS BY EXAMPLE	$24.72 TOTAL			
4 soft cover texts				
4 Teacher's Commentary and Solutions Manuals				
Exploring Data	$3.64	No	1/participant	Yes
Teachers' Commentary & Solutions Manual	$2.44	No	1	Yes
Weighing Chances	$3.64	No	1/participant	Yes
Teachers' Commentary & Solutions Manual	$2.44	No	1	Yes
Detecting Patterns	$3.84	No	1/participant	Yes
Teacher's Commentary & Solutions Manual	$2.44	No	1	Yes
Finding Models	$3.84	No	1/participant	Yes
Teachers' Commentary & Solutions Manual	$2.44	No	1	Yes

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6.0 HISTORY OF DEVELOPMENT

6.1 Identification of the developer:

Editors are -- Frederick Mosteller, professor and statistician at Harvard University, William H. Kruskal, Professor at University of Chicago, Richard S. Pieters, teacher at Phillips Academy, Andover, Massachusetts, Gerald R. Rising, professor at State University of New York at Buffalo, Richard F. Link, Artronic Information Systems, Inc.

6.2 How developed and when:

This material was developed in 1971 and 1972 by the Joint Committee on the Curriculum in Statistics and Probability of the American Statistical Association and the National Council of Teachers of Mathematics. Material was drafted, then sent to teachers for review. Revisions were then made.

6.3 Evidence of effectiveness with users:

The material was tested by professional statisticians and experienced teachers, but no formal data on results was given.

DESCRIBER CRITIQUE

Appropriateness / adaptability / technical quality:

The need addressed in the series is for statistical material using real-life problems accompanied by more exposition in the text than is usually found in math books. The series meets this need fully. The product is adaptable for group or individual use and for teachers and students from 9th grade through college. As the products focus is on relevant, usable statistics, it is able to provide information which is of practical use to students and teachers in disciplines outside of math or statistics.

All four books are clearly written, well organized and systematically laid out. Overall technical quality is good.

Content accuracy/social fairness/community acceptance issues:

Content appears accurate, without ethical or sexual bias, or controversial comment.

Overall summary/comment:

This series is excellent because of its practicality and unusual topic selection. Clear language and good organization are also strengths. Technical layout is very good.

It is felt that an elementary statistics text is almost necessary as a component of the series. A bibliography would also be helpful. The series probably would require an instructor for maximum benefit.

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